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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/989,962	11/21/2001	Hidefumi Nakata	P/1071-1504	1666

7590 03/16/2004
Keating & Bennett LLP
10400 Eaton Place
Suite 312
Fairfax, VA 22030

EXAMINER

DIAZ, JOSE R

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/989,962	NAKATA, HIDEFUMI	
	Examiner	Art Unit	
	José R Díaz	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 11 and 13-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 11 and 13-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>October 8, 2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 10, 2004 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-5, 11 and 13-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.

In the instance case, claim 1, as now amended, recites a lower electrode comprising five layers (e.g. a metal oxide layer formed over first and second titanium layers, a platinum layer and a gold layer). However, the specification provides support for only four layers, e.g. a metal oxide layer formed over the

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gold layer, the platinum layer, and the first titanium layer (page 4, lines 16-18 and 21-22). Please note that the second titanium layer is oxidized to form the metal oxide layer (page 4, lines 21-22). Therefore, the specification does not provide support for the claimed structure.

Claims 2-5, 11, and 13-15 are rejected due to their dependency on claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

As far as understood, claims 1-5, 11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Apel (US Pat. No. 5,208,726) in view of Lee et al. (US Pat. No. 6,509,601 B1)

Regarding claims 1 and 14, Apel teaches an MIM capacitor comprising: a lower electrode (36) (see fig. 3) comprising a plurality of metal layers including a first titanium layer, a platinum layer, and a gold layer (see col. 4, line 50); an upper electrode (44) (see fig. 3); and a SiN dielectric layer (40) positioned between said lower electrode and said upper electrode (see fig. 3 and col. 4, lines 52-53).

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However, Apel fails to teach an insulating metal oxide layer comprising titanium disposed on the entire surface of the lower electrode. Lee et al. teaches that it is well known in the art to provide a dielectric composite layer (124a) (see col. 11, lines 61-62) comprising a metal oxide layer of TiO_2 (see col. 11, line 57) and a SiN layer (see col. 11, line 58).

With regards to the limitation about the second titanium layer, it is noted that the final structure, as stated above in the claim rejection under 35 U.S.C. § 112 (first paragraph), does not include such layer, but an oxidized titanium layer, which is taught by Lee et al. (see col. 11, line 57). Thus, for purpose of this rejection, the second titanium layer will not be considered as part of the final structure, but as a part of an oxidation process that results in the formation of the metal oxide layer (i.e. TiO_2). As such, the limitation about the second titanium layer contains method of process of making characteristics; therefore given no patentable weight in determining patentability of the final device structure. Note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); In re Marosi et al., 218 USPQ 289; and particularly In re Thorpe, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not.

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Note that applicant has the burden of proof in such cases, as the above case law makes clear.

Apel and Lee et al. are analogous art because they are from the same field of endeavor as applicant's invention. At the time of the invention it would have been obvious to a person of ordinary skill in the art to include a TiO₂ metal oxide layer over the plurality of metal layers. The motivation for doing so, as is taught by Lee et al., is to provide a high capacitance (col. 11, lines 55-57). Therefore, it would have been obvious to combine Lee et al. with Apel to obtain the invention of claims 1.

Regarding claims 2-3, Lee et al. teaches that the metal oxide comprises titanium (e.g. TiO₂) (see col. 11, line 57). In addition and with regards claim 2, it has been held that the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. Therefore, it does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

Regarding claim 4, Apel teaches that the dielectric layer comprises silicon nitride (see col. 4, line 53).

Regarding claim 5, Lee et al. teaches an oxidized silicon nitride layer, e.g. SiO₂/SiN (see col. 11, line 58).

Regarding claim 11, Apel teaches a microwave monolithic IC comprising an MIM capacitor as set forth in claim 1 (see col. 3, lines 26-28).

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Regarding claims 13 and 15, Apel teaches an upper electrode (44) formed, in order, by a titanium layer, a platinum layer, and a gold layer (see col. 4, line 59).

Response to Arguments

Applicant's arguments with respect to claims 1-5, 11, and 13-15 have been considered but are moot in view of the new ground(s) of rejection.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R Díaz whose telephone number is (571) 272-1727. The examiner can normally be reached on 9:00-5:00 Monday through Friday.

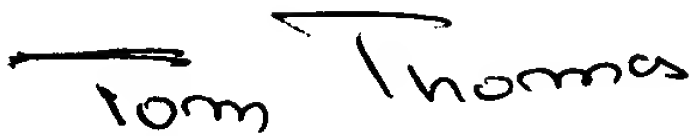
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JRD
3/8/04


Tom Thomas
Supervisory Patent Examiner
Technology Center 2800